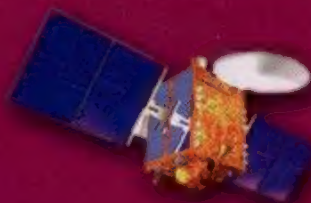


GSLV-F04 INSAT 4CR Mission



Indian Space
Research
Organisation



SUCCESSFUL FLIGHTS



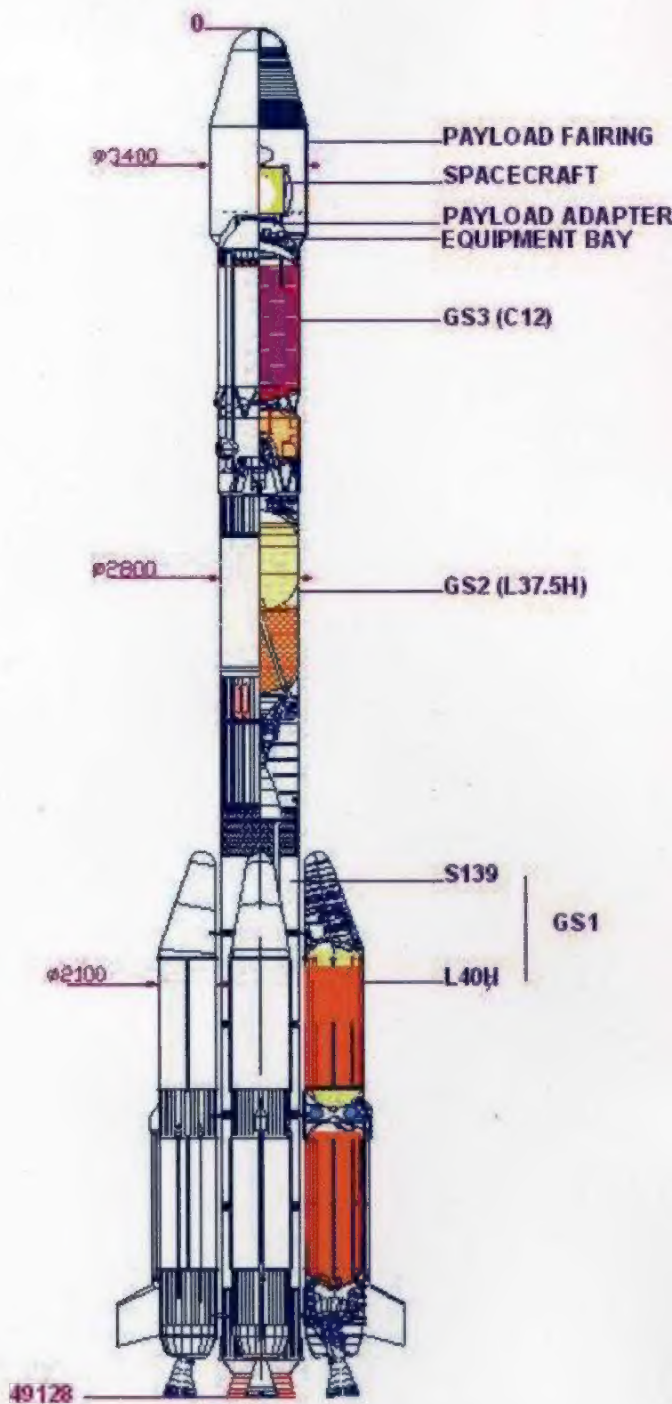
GSLV D1/G-Sat 1 Mission
Spacecraft mass: 1540 kg
April 18, 2001



GSLV D2/G Sat 2
Mission
Spacecraft mass:
1823 kg
May 8, 2003



GSLV F01
Edusat Mission
Spacecraft mass
1950 kg
September 20, 2004



GSLV CONFIGURATION

GSLV at a Glance

Overall length	: 49.128m
Lift off mass	: 414.75t
Stages	: 3
Payload	: INSAT-4CR
Payload mass	: 2140 kg
Orbit	: GTO



Solid Motor (S139)

Stage Parameters

Parameter	1st stage (GS1)		2nd stage (GS2)	3rd stage (GS3)
	S139	L40 strapon		
Length (m)	20.134	19.682	11.565	8.72
Diameter (m)	2.8	2.1	2.8	2.8
Total mass (t)	161	190	44	15
Propellant	HTPB	UH25 & N2O4	UH25 & N2O4	LOX & LH2
Propellant mass (t)	138	42	39	12.5



GS2 Stage (L37.5H)



Liquid Strapon (L40H)



Cryo Stage (C12)

Major changes from GSLV-F02

- Indigenous IS 1/2 V
- Telecommand system reconfigured as in GSLV D1
- Stainless steel water tank in GS2
- New control logic in DAP for GS1 phase
- ALS scheme revised for L40 upper & lower bound performance check

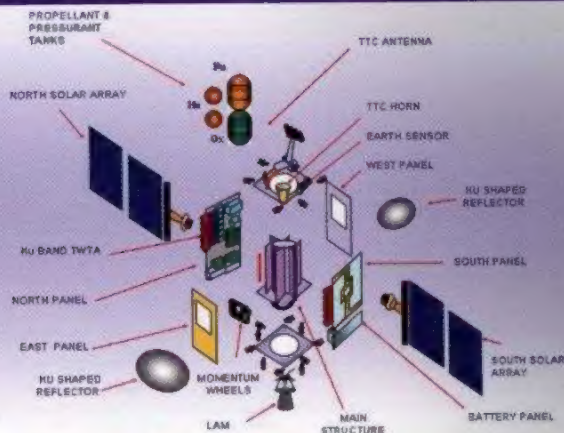
Indigenous IS 1/2 V

The indigenous IS 1/2V is of bolted construction with a nominal diameter of 2800 mm and 1752 mm height. The open isogrid is machined from Aluminium plates, rolled into two halves and bolted longitudinally. The aft end and fore end rings are bolted to the above open isogrid cylindrical structure. The isogrid structure is made of AA 7075 Aluminium alloy and the end rings are of AA 2014 Aluminium alloy. The IS1/2V structure is painted with PC10 to limit the temperature of the structure within acceptable limits when exposed to hot exhaust gases of GS2 engine during GS1 – GS2 separation.

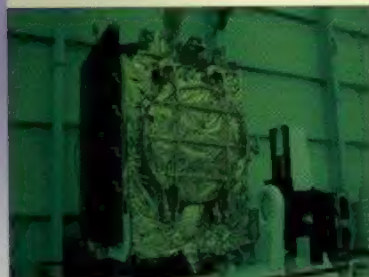


INSAT-4CR salient features

Insat-4 CR Exploded View



Insat-4 CR



Size	: 1.65X1.53X2.4m cuboid (Launch Configuration)	Onboard Power Generation	: 2867 W (2 wing solar array with 2 panels per wing)
Lift off Mass	: 2140 kg	Battery	: 2 x 70 Ah nickel hydrogen
Bus Configuration	: Standard I2K with stretched propellant tanks	Deployed Configuration size	: North-South 9450 mm East-West 5950 mm
Location in orbit	: 74 ° East	On-orbit Attitude Control	: Momentum biased 3-axis stabilized mode
Mission life	: 10 years		Bipropellant – MMH, MON-3
Payload	: 10/12 Channel High Power Ku-Band Transponders Ku-Band Beacon Transmitter 2.2mx2m Offset Shaped Reflector Antenna (Tx) East side 1.4m Offset Shaped Reflector Antenna (Rx) West side		

Flight Sequence

The overall flight sequence is given highlighting the nominal time, altitude and inertial velocity at critical flight events. Actual time of occurrence can vary since they are decided onboard.

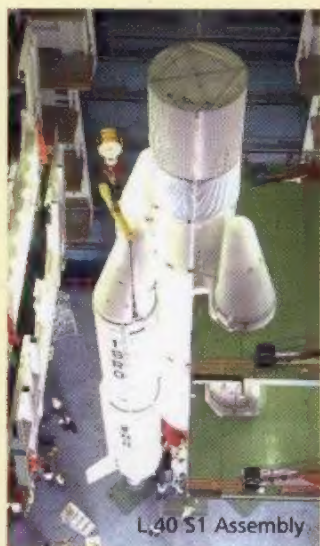
GSLV F04 / INSAT-4CR MISSION FLIGHT PROFILE



Event	Time(s)	Altitude(km)	Velocity(km/s)
Lift Off (S139 Ignition)	0	0.026	0.452
GS1 Shutt Off	147.7	68.78	2.808
GS2 Ignition	148.3	69.23	2.809
GS1 Separation	149.9	70.45	2.810
IS 1/2M Separation	155.7	74.73	2.866
Heat Shield Separation	227.8	115.00	3.870
GS2 Separation	291.0	132.82	5.372
GS3 Shutt Off	1000.9	218.52	10.215
Satellite Separation	1015.9	231.68	10.223

Launch Campaign activities at SHAR





L40 S1 Assembly



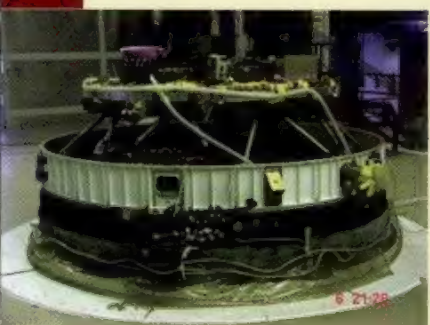
L 40 S3 Assembly



GS2 assembly



Cryo stage assembly



Equipment bay



Encapsulation of Spacecraft

SUCCESSFUL FLIGHTS



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